Organizational Learning at NASA: The *Challenger* and *Columbia* Accidents.

Julianne G. Mahler. Washington, DC: Georgetown University Press, 2009. 238 pp. $29.95, paper.

Mahler's book starts with a very interesting premise: given the similarities in causes in the *Challenger* and *Columbia* disasters, there may be evidence that NASA is "not a learning organization." The book seeks to establish whether there was any evidence of learning from the *Challenger* (and indeed some, albeit limited learning seems to have occurred) and then to propose some analyses and lessons from the various areas in which learning was lacking. The detailed case analysis and findings are useful in grounding learning processes in a real-world case—one in which the causes of one major accident are eerily reflected in a second major accident 17 years later.

The causes of both disasters lay in technical issues (O-ring blow by and foam shedding), which had been experienced many times previously, had been "normalized" (Vaughan, 1996), and over which individuals in the organization had expressed concerns. Both commissions charged with investigating the disasters (the Rogers Commission for *Challenger* and the *Columbia* Accident Investigating Board) strongly implicated organizational issues that led to each of the disasters. The organizational problems, including cultural and other informal organization issues, were well known and were also well covered by Vaughan (1996, 2005). And yet the same organizational problems that created the *Challenger* accident in 1986 are implicated in the *Columbia* accident in 2003. So why didn't NASA learn more from *Challenger*—learn things that would have helped prevent *Columbia*?

The author uses a definition of learning that minimally includes processes that result in (1) problem awareness; (2) cause-effect inferences; and (3) the institutionalization of actions designed to eliminate problem causes. Although the learning definition and review of the learning literature are not the strongest part of the book, the detailed analyses of non-learning (and unlearning) and their organizational causes are insightful. Also insightful is the author's observation of how effects at the organization level combine with regulatory pressures to affect learning processes and outcomes. Returning to the question of why NASA didn't learn, the author's analysis shows that one part of the answer is that NASA did, in fact, learn something about managing contractor relationships, basically eliminating them as contributors to the *Columbia* disaster. The learning processes and outcomes in this area are outlined in some detail in chapter 4. Yet, at the same time, there were many other learning opportunities that NASA failed to take advantage of, and whether it was a lack of attention, of analysis, or of implementation varied by situation. While it's always hard to go back and predict what else might have occurred had something different been done, it seems that the implementation of fairly well-known and well-understood changes to NASA's structure, culture, and decision-making processes might have at least increased the likelihood of preventing the *Columbia* accident. Instead, these opportunities, all

recommendations from the Rogers Commission, were (1) not learned, (2) learned only superficially, or (3) learned and then subsequently unlearned.

I found the learning and then unlearning, which is outlined in chapter 3, particularly fascinating, as the idea of unlearning has not received much attention in the literature. One of the key instances of unlearning at NASA occurred around organizational structure. One cause of problems that created conditions leading to the *Challenger* accident was an organizational structure in which different elements of the shuttle program were placed under the command of different NASA centers. The Rogers Commission noted this as problematic, in part because rivalry among centers, different organizational cultures, lack of responsibility and accountability, and cross-center communication issues created information and coordination problems that led directly to the *Challenger* accident. After *Challenger*, the shuttle program structure was redesigned under centralized headquarters responsibility, an explicit return to the structure that had worked well with the *Apollo* program and a good instance of learning from earlier experiences. The new centralized structure improved communication and coordination issues and remained in place until the 1990s. But then reorganization occurred under the administration of Dan Goldin, and the system reverted to a decentralized structure under different centers. This was done as part of a series of efforts to improve efficiency and also to respond to rather severe external political and budgetary pressures. The return to a decentralized structure contributed to the same communication and coordination problems as before, creating conditions favoring the *Columbia* disaster.

In addition to learning and then unlearning, there are also examples of non-learning and superficial learning from the *Challenger* accident. Many instances of non-learning and superficial learning came as a result of external political and budgetary pressures. The effect of political pressure on organizational learning (or non-learning, in this case) is an interesting extension of our existing learning theories. Chapter 5 outlines the pressures and NASA's non-learning responses and includes the interesting idea that the downsizing of NASA, which created many learning problems as organizational memory disappeared with staff cutbacks, was a mimetic response to prevailing faddish ideas about the benefits of downsizing prevalent in the 1990s.

The last of the detailed case analysis chapters, chapter 6, looks at how cultural issues at NASA inhibited learning. One of the strengths of the book is the detailed analysis of the three different processes through which unlearning and non-learning take place: never learn, learn then unlearn, and learn superficially (or symbolically). This book deepens our understanding of the complexities of learning processes in the public service context, but it should also be useful to all scholars of organizations and organizational learning for its detailed analysis of the non-learning and unlearning that occurred between the two disasters. There are likely many cases of private organizations failing to learn or unlearning previously learned lessons, and though there have been useful explorations of the processes involved in organizational

mistakes and failures, repeated failures by a single organization and especially the processes that lead to unlearning remain relatively underexplored.

The last two chapters of the book are devoted to outlining the implications of the previous chapters for managers, regulators, and other interested parties. One chapter is devoted to the challenges of learning in public organizations. The other outlines specific recommendations for organizational structures and processes, especially learning processes, that might help avoid repeated failures. Organizational scholars will see similarities in these recommendations to existing work on high reliability organizations (e.g., Weick, Sutcliffe, and Obstfeld, 1999). But there are interesting additions and explorations of things like the role of personnel turnover and political pressures as barriers to organizational learning; learning and non-learning are intertwined with internal and external factors, and multiple institutional forces can interfere with the learning process. This is an interesting detailed analysis of non-learning in an organization, and both the analysis and the recommendations should be of interest to varied audiences: practitioners, political scientists, policy makers, and organizational theorists.

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